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TRANSMITTAL FORM

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Application Number	10/633,764
Filing Date	August 4, 2003
First Named Inventor	Chang
Group Art Unit	1772
Examiner Name	Sandra M. Nolan
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ENCLOSURES *(check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment / Response
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
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- ☐ Assignment Papers *(for an Application)*
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- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
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- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) *(please identify below)*:

  Amended Appeal Brief Under 37 C.F.R. 41.37 and Return Postcard

Remarks

The Commissioner is hereby authorized to charge any additional fees that may be required under 37 CFR 1.16 or 1.17 to Deposit Account No. 08-0750. A duplicate copy of this sheet is enclosed.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm *or* Individual name	Harness, Dickey & Pierce, P.L.C.	Attorney Name Anna M. Budde	Reg. No. 35,085
Signature	Anna M Budde		
Date	February 1, 2007		

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	10/633,764
Filing Date:	August 4, 2003
Applicants:	Yihua Chang et al.
Group Art Unit:	1772
Examiner:	Michael C. Miggins
Title:	Membranes with Fluid Barrier Properties and Articles Containing Such Membranes
Docket No .:	4022-000009

Director of the United States Patent and Trademark Office
Board of Patent Appeals and Interferences
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Amended Appeal Brief Under 37 C.F.R. § 41.37

Sir:

This Amended Appeal Brief addresses the paper mailed January 24, 2007, which stated that "The claimed invention is not mapped to the independent claims which shall refer to the specification by page and line number and to the drawings, [if] any."

This response is due February 24, 2007.

Table of Contents

Real Party in Interest

The real party in interest is Nike, Inc., a corporation of the State of Oregon, to which the inventors assigned all rights in this invention. The assignment was recorded in the United States Patent and Trademark Office on August 4, 2003 at reel 014371, frame 0890.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of Claims

Claims 1, 4-28, and 30-54, are pending in the application and stand finally rejected. This appeal is taken as to all of the rejected claims, claims 1, 4-28, and 30-54.

Status of Amendments

No amendment was filed after the final rejection.

Summary of Claimed Subject Matter

Applicants claim in independent claim 1 a resilient membrane comprising an elastomeric material, a polymeric fluid barrier material, and a laminar nano-filler. A "membrane" is a free-standing film separating one fluid from another. Page 5, lines 2-6 (first four lines of paragraph 10); Figures 1 and 2. The elastomeric material provides resiliency and dimensional stability to the membrane, while the polymeric fluid barrier material prevent transfer of a fluid through the membrane. Page 4, lines 12-15 (paragraph 8, lines 8-11). The laminar nano-filler has average platelet thickness of up to about 10 nanometers, an average aspect ratio of at least about 200, and at least one of height and width of from about 0.1 micron to about 1.5 microns to achieve improved barrier properties without reduced resilience or increased opacity or haziness. Page 4, lines 15-18 (paragraph 8, lines 11-14). The amount and size of the nano-filler flake allow it to improve gas barrier properties and toughness without substantially affecting the clarity of the membrane. Page 21, lines 5-12 (paragraph 44, lines 2-9).

Claims 4-12 depend on claim 1.

Independent claim 13 is similar to claim 1 but specifies that at least one elastomeric layer comprises the elastomeric material and at least one barrier layer comprises the polymeric fluid barrier material. Page 4, lines 9-12 (lines 5-8 in paragraph 8); Figures 1, 2, 3. The nano-filler is in the barrier layer. Page 7, lines 9-16 (lines 5-12 in paragraph 19).

Claims 14-27 depend on claim 13.

Independent claim 28 claims a bladder comprising an elastomeric barrier membrane. The membrane has a microlayer polymeric composite layer having at least about 10 microlayers, each microlayer individually being up to about 100 microns thick, said microlayers alternating between at least one polymeric gas barrier material and at least one elastomeric

material. Figures 2 and 3. The microlayers of polymeric fluid barrier material or the microlayers of elastomeric material, or both, comprise a laminar nano-filler as described for claim 1. Page 28, lines 1-3 & 16-17 (paragraph 58, lines 1-3 & paragraph 59, lines 1-2); Figures 2 and 3. Figures 2 and 3 illustrate membranes having a microlayer polymeric composite layer 124. The microlayer polymeric composite layer is particularly aided by including the nano-filler because the process of forming the microlayers tends to align the nano-filler generally parallel to the faces fo the microlayer polymeric composite layer. Page 26, lines 16-23 (paragraph 56). The microlayer polymeric composite layer is described in more detail at page 23, paragraph 49 through page 25, paragraph 53. Page 23, line 4-page 25, line 20; Figure 3. The membrane can include other layers in addition to the microlayer polymeric composite layer. Page 26, lines 3-14 (paragraph 55).

Claims 30-54 depend on claim 28.

Grounds of Rejection to Be Reviewed on Appeal

Claims 1-27 stand rejected under 35 U.S.C. 102(b) as unpatentable over Watkins, WO 02/36196 A1 in view of Frisk, U.S. Patent No. 6,117,541. Appellants have cancelled claims 2 and 3.

Claims 28-54 stand rejected under 35 U.S.C. 103(a) as unpatentable over Watkins, WO 02/36196 A1 in view of Frisk, U.S. Patent No. 6,117,541 and further in view of Fibiger, WO 00/47657 and Bagrodia, WO 01/92388 A2. Appellants have cancelled claim 29.

Claims 1-54 stand provisionally rejected for obviousness-type double patenting over claims 20-25 of US Application 09/704,881 in view of Frisk, U.S. Patent No. 6,117,541. Appellants have cancelled claims 2, 3, and 29.

Argument

I. Claims 1 and 4-27 are patentable over Watkins, WO 02/36196 A1 in view of Frisk, U.S. Patent No. 6,117,541.

The rejection fails to state a prima facie case of obviousness because the Frisk patent teaching that incorporating its nanometer-size clay particles increases stiffness of an article would lead one away from adding such material to the Watkins membrane, which must be elastic.

The Frisk patent teaches incorporating nanometer size clay particles I into a polyolefin food package. Column 1, lines 16-20; column 2, lines 16-25. The Frisk patent discloses, "In addition to enhancing the barrier properties of containers the clay platelets also enhance the heat stability and mechanical properties of the container. . . . The integrated clay platelets also *increase the stiffness* of the container . . . . Therefore, even small weight percentages of the clay material relative to the polymer material provide substantial increases in the impermeability of the integrated polyolefin layer, and in the overall properties of the container." Column 4, lines 13-28 (emphasis added; reference numerals omitted). The Frisk patent, while including its nanometer size clay platelets for enhanced barrier properties, also acknowledges that including its nanometer size clay platelets also substantially increases the stiffness of its container. Thus, the Frisk patent teaches away from so modifying articles for which increased stiffness is undesirable.

The Watkins publication teaches that flexibility is needed for its membranes, which function as gas-filled shoe cushioning bladders. Page 3, lines 19-24; page 15, lines 27-35. A person of ordinary skill in the art who desired to make a resilient membrane, as described in the Watkins publication, would not turn to the Frisk teachings because the Frisk patent specifically

teaches that including its clay platelets will substantially increase the stiffness of the material, even when added in small amounts. Thus, one or ordinary skill in the art would be led away from making the present invention by the teachings of the Frisk patent. It is well-settled that a reference that teaches away an invention cannot make it obvious. "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley,* 27 F.3d 551, 553, 31 U.S.P.Q.2d 1130, 1131 (Fed. Cir. 1994).

The Office Action mailed January 12, 2006[1] argues that "Frisk only briefly discusses the stiffening effect" and the "overwhelming purpose of adding the platelets is to increase the gas barrier properties of the film." Still, "barely" mentioned or not, overwhelming purpose or not, the Frisk patent *as a whole* teaches that its filler stiffens an article when added and teaches away from making such a modification should one desire to avoid such increased stiffness. The Office Action tries to read into the Frisk reference a distinction between how much of the clay platelets is need for increased barrier properties and how much will give increased stiffness. The discussion of this property in the Frisk patent, however (quoted above) simply does not countenance such a distinction; it teaches that the disclosed changes all occur at even small weight percentages of the clay ("*and* in the overall properties of the container") (emphasis added).

[1] For some reason, the final Office Action mailed August 22, 2006 does not mention or discuss the rejections or art of record. Consequently, all of our references will be to the preceding Office Action mailed in January 2006.

Applicants avoid such stiffening by limiting size of nano-filler and amount (claims 1 and 13, "wherein the amount of the laminar nano-filler does not appreciably decrease the resilience of the membrane").

For these reasons, Appellants respectfully submit that claims 1 and 4-27 are patentable over the cited references, and request this Honorable Board to REVERSE the rejection over Watkins, WO 02/36196A1 in view of Frisk, U.S. Patent 6,117,541 and further in view of Fibiger et al., WO 00/47657 and Bagrodia et al., WO 01/92388A2.

II. Claims 28 and 30-54 are patentable over Watkins, WO 02/36196 A1 in view of Frisk, U.S. Patent No. 6,117,541, Fibiger, WO 00/47657, and Bagrodia, WO 01/92388 A2.

The combination of references teaches away from Appellants' invention, as Appellants' bladder comprises an elastomeric barrier membrane in which the amount of the laminar nano-filler does not appreciably decrease the resilience of the membrane, while the Frisk patent on which the rejection relies for teaching a nanometer size clay teaches that including its filler stiffens an article. Further, the combination of references fails to teach or suggest each and every limitation of the invention claimed in claims 28 and 30-54, as none of the references teaches a membrane having as a layer a mcirolayer polymeric composite material in which a laminar ano-filler is in microlayers of polymeric fluid barrier material.

First, the combination of the Watkins publication and the Frisk patent fail to suggest certain aspects of the bladder having an elastomeric membrane, as discussed above. Neither the Fibiger publication or the Bagrodia publication would overcome the firm teaching of the Frisk

patent that including its clay nanofiller stiffens an article, a result unacceptable where resiliency is paramount.

Second, the Fibiger and Bagrodia references have been cited as disclosing articles of 10 or more layers; claims 28 and 30-54, however, are directed to membranes that include one layer of a *microlayer* polymeric composite, as described in Appellants' specification at paragraphs 49-53 on pages 23-25.

For these reasons, Appellants respectfully submit that claims 28 and 30-54 are patentable over the cited references, and request this Honorable Board to REVERSE the rejection over Watkins, WO 02/36196A1 in view of Frisk, U.S. Patent 6,117,541,

III. Claims 1, 4-28, and 30-54 are patentable over US Application 09/704,881 in view of Frisk, U.S. Patent No. 6,117,541.

Applicants respectfully submit that, as argued above, the Frisk patent teaches away from including its clay platelets in a resilient or elastomeric membrane.

Claims 20-25 of copending application 09/704881 provide a laminate formed by a method for improving interlayer adhesion by forming a laminate with adjacent thermoplastic elastomer and thermoplastic polymeric barrier layers, then annealing the laminate at a temperature above a thermal transition temperature of a polymeric component in one of the layers. It would not have been obvious to incorporate the filler of the Frisk reference into the laminate of Application No. 09/704881 because the Frisk reference does not suggest that its filler has any effect on improved adhesion between adjacent layers of a laminate membrane.

Furthermore, the present claims are to a resilient membrane, while the Frisk reference teaches that incorporating its clay platelets increases stiffness, thus teaching away for both

resilient layers and incorporating clay into layers if resiliency is desired. Thus, one skilled in the art would be led away from combining the teaching of the Frisk patent with a laminate formed by a method of Application No. 09/704881 if one desired a resilient membrane.

Finally, neither reference suggests the subject matter of claims 28 and 30-54, having a microlayer polymeric composite layer.

Thus, for all these reasons, Appellants respectfully submit that a prima facie case of obviousness-type double patenting is not shown from these references and request this Honorable Board to REVERSE the rejection,

Conclusion

The present claims are patentable over the cited art. Applicants, therefore, respectfully petition this Honorable Board to reverse the final rejection of the claims on each ground and to indicate that all claims are allowable.

Respectfully submitted,

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Claim Appendix

Copy of the Claims Appealed

1. A resilient membrane, comprising an elastomeric material and a polymeric fluid barrier material comprising a laminar nano-filler having an average platelet thickness of up to about 10 nanometers, an average aspect ratio of at least about 200, and at least one of height and width being independently from about 0.1 micron to about 1.5 microns, wherein the amount of the laminar nano-filler does not appreciably decrease the resilience of the membrane.

2. (cancelled)

3. (cancelled)

4. A membrane according to claim 1, wherein the elastomeric material is selected from the group consisting of polyurethane elastomers, flexible polyolefins, styrenic thermoplastic elastomers, polyamide elastomers, polyamide-ether elastomers, ester-ether and ester-ester elastomers, flexible ionomers, thermoplastic vulcanizates, flexible poly(vinyl chloride) homopolymers and copolymers, flexible acrylic polymers, and combinations thereof.

5. A membrane according to claim 1, wherein the elastomeric material is selected from the group consisting of thermoplastic polyester-polyurethanes, thermoplastic polyether-polyurethanes, thermoplastic polycarbonate-polyurethanes, and combinations thereof.

6. A membrane according to claim 1, wherein the polymeric fluid barrier material is selected from the group consisting of ethylene-vinyl alcohol copolymers, poly(vinyl chloride), polyvinylidene polymers and copolymers, polyamides, acrylonitrile polymers, polyurethane engineering plastics, poly(methyl pentene) resins, ethylene-carbon monoxide copolymers, liquid crystal polymers, polyesters, polyimides, and combinations thereof.

7. A membrane according to claim 1, wherein the polymeric fluid barrier material comprises an ethylene-vinyl alcohol copolymer.

8. A membrane according to claim 1, wherein the laminar nano-filler has an average thickness of from about 1 nm to about 10 nm and an aspect ratio from about 200 to about 1000.

9. A membrane according to claim 1, wherein the laminar nano-filler is a montmorillonite clay.

10. A membrane according to claim 1, wherein the membrane comprises from about 4 to about 10 weight percent of the laminar nano-filler.

11. A permanently sealed, inflated bladder comprising a membrane according to claim 1.

12. A permanently sealed, inflated bladder comprising a membrane according to claim 2.

13. A resilient membrane, comprising at least one elastomeric layer comprising an elastomeric material and at least one barrier layer comprising a polymeric fluid barrier material and that further comprises a laminar nano-filler having an average platelet thickness of up to about 10 nanometers, an average aspect ratio of at least about 200, and at least one of height and width being independently from about 0.1 micron to about 1.5 microns, wherein the amount of the laminar nano-filler does not appreciably decrease the resilience of the membrane.

14. A membrane according to claim 13, wherein the elastomeric material is selected from the group consisting of polyurethane elastomers, flexible polyolefins, styrenic thermoplastic elastomers, polyamide elastomers, polyamide-ether elastomers, ester-ether and ester-ester elastomers, flexible ionomers, thermoplastic vulcanizates, flexible poly(vinyl chloride) homopolymers and copolymers, flexible acrylic polymers, and combinations thereof.

15. A membrane according to claim 13, wherein the elastomeric material is selected from the group consisting of thermoplastic polyester-polyurethanes, thermoplastic polyether-polyurethanes, thermoplastic polycarbonate-polyurethanes, and combinations thereof.

16. A membrane according to claim 13, wherein the polymeric fluid barrier material is selected from the group consisting of ethylene-vinyl alcohol copolymers, poly(vinyl chloride), polyvinylidene polymers and copolymers, polyamides, acrylonitrile polymers, polyurethane engineering plastics, poly(methyl pentene) resins, ethylene-carbon monoxide copolymers, liquid crystal polymers, polyesters, polyimides, and combinations thereof.

17. A membrane according to claim 13, wherein the polymeric fluid barrier material comprises an ethylene-vinyl alcohol copolymer.

18. A membrane according to claim 13, wherein the laminar nano-filler has an average thickness of from about 1 nm to about 10 nm and an aspect ratio from about 200 to about 1000.

19. A membrane according to claim 13, wherein the laminar nano-filler is a montmorillonite clay.

20. A membrane according to claim 13, wherein the membrane comprises from about 4 to about 10 weight percent of the laminar nano-filler.

21. A permanently sealed, inflated bladder comprising a membrane according to claim 13.

22. A permanently sealed, inflated bladder comprising a membrane according to claim 15.

23. A permanently sealed, inflated bladder comprising a membrane according to claim 17.

24. A permanently sealed, inflated bladder comprising a membrane according to claim 18.

25. A permanently sealed, inflated bladder comprising a membrane according to claim 20.

26. A bladder according to claim 21, wherein said bladder is inflated with a gas comprising nitrogen.

27. A bladder according to claim 24, wherein said bladder is inflated with a gas comprising nitrogen.

28. A bladder, comprising an elastomeric barrier membrane, wherein:

said membrane comprises a microlayer polymeric composite layer having at least about 10 microlayers, each microlayer individually being up to about 100 microns thick, said microlayers alternating between at least one polymeric gas barrier material and at least one elastomeric material;

and further wherein said microlayers of polymeric fluid barrier material comprise a laminar nano-filler having an average platelet thickness of up to about 10 nanometers, an average aspect ratio of at least about 200, and at least one of height and width being independently from about 0.1 micron to about 1.5 microns, wherein the amount of the laminar nano-filler does not appreciably decrease the resilience of the membrane.

29. (cancelled)

30. A bladder according to claim 28, wherein said elastomeric material comprises a member selected from the group consisting of polyurethane elastomers, flexible polyolefins, styrenic thermoplastic elastomers, polyamide elastomers, polyamide-ether elastomers, ester-ether elastomers, ester-ester elastomer, flexible ionomers, thermoplastic vulcanizates, flexible

poly(vinyl chloride) homopolymers and copolymers, flexible acrylic polymers, and combinations thereof.

31. A bladder according to claim 28, wherein said elastomeric material includes a polyurethane elastomer.

32. A bladder according to claim 28, wherein said elastomeric material includes a member of the group consisting of thermoplastic polyester diol-based polyurethanes, thermoplastic polyether diol-based polyurethanes, thermoplastic polycaprolactone diol-based polyurethanes, thermoplastic polytetrahydrofuran diol-based polyurethanes, thermoplastic polycarbonate diol-based polyurethanes, and combinations thereof.

33 A bladder according to claim 32, wherein the elastomeric material comprises a thermoplastic polyester diol-based polyurethane.

34. A bladder according to claim 33, wherein the polyester diol of said polyurethane is a reaction product of a mixture comprising at least one dicarboxylic acid, dicarboxylate ester, or anhydride selected from the group consisting of adipic acid, glutaric acid, succinic acid, malonic acid, oxalic acid, anhydrides of these acids, and mixtures thereof and at least one diol selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, propylene glycol, dipropylene glycol, tripropylene glycol, tetrapropylene glycol, 1,3-

propanediol, 1,4-butanediol, neopentyl glycol, 1,5-pentanediol, 1,6-hexanediol, and mixtures thereof.

35. A bladder according to claim 28, wherein the fluid barrier material comprises a member selected from the group consisting of ethylene vinyl alcohol copolymers, polyvinylidene chloride, acrylonitrile copolymers, polyethylene terephthalate, polyamides, crystalline polymers, polyurethane engineering thermoplastics, and combinations thereof.

36. A bladder according to claim 28, wherein the fluid barrier material comprises an ethylene-vinyl alcohol copolymer.

37. A bladder according to claim 28, wherein said microlayer polymeric composite includes at least about 50 microlayers.

38. A bladder according to claim 28, wherein said microlayer polymeric composite includes from about 10 microlayers to about 1000 microlayers.

39. A bladder according to claim 28, wherein said microlayer polymeric composite layer includes from about 50 microlayers to about 500 microlayers.

40. A bladder according to claim 28, wherein the average thickness of each fluid barrier material microlayer is independently from about 0.01 micron to about 2.5 microns thick.

41. A bladder according to claim 28, wherein the average thickness of the microlayer polymeric composite layer is from about 75 microns to about 0.5 centimeter.

42. A bladder according to claim 28, wherein said membrane further comprises at least one layer including an elastomeric polyurethane.

43. A bladder according to claim 42, wherein said membrane comprises further layers including an elastomeric polyurethane adjacent to either side of the microlayer polymeric composite layer.

44. A bladder according to claim 28, wherein the bladder is inflated with a gas.

45. A bladder according to claim 28, wherein said bladder is inflated with a gas comprising nitrogen.

46. A bladder according to claim 44, wherein the inflating gas is at a pressure of at least about 3 psi.

47. A bladder according to claim 28, wherein the bladder is permanently sealed.

48. A bladder according to claim 29, wherein the laminar nano-filler has an average thickness of from about 1 nm to about 10 nm and an aspect ratio from about 200 to about 1000.

49. A bladder according to claim 29, wherein the laminar nano-filler is a montmorillonite clay.

50. A bladder according to claim 29, wherein the membrane comprises from about 4 to about 10 weight percent of the laminar nano-filler.

51. A shoe, comprising at least one bladder according to claim 28.

52. A shoe according to claim 51, wherein the bladder is incorporated as a portion of said sole.

53. A shoe according to claim 51, wherein said bladder forms at least a part of an outer surface of said shoe.

54. A ball, comprising a bladder according to claim 28.

EVIDENCE APPENDIX

Evidence entered by examiner and relied on by appellant

none.

RELATED PROCEEDINGS APPENDIX

None.